COMPUTER SOFTWARE

Software is a set of programs that instructs the computer about tasks to be performed.

Software is a set of logical instructions and algorithms that govern the operation of a computer and its associated hardware.

Software can be broadly classified into two categories:

1.System software

2.Application software

1.SYSTEM SOFTWARE

System software provides the basic functions that are performed by the computer. It is responsible for managing and organising the computer system itself. It most includes operating systems, device drivers, bios and other low-level software.

System software creates a platform for application software to run on and allows them to interact with the hardware.

System software controls computer hardware and manages resources such as memory and power.

On the basis of functionality system software can be divided into two categories:

1.System software for management and functionality of computers.

2.System software for development of application and other software.

1.System software for management and functionality of computers.

This category of system software focuses on managing hardware resources. It provides support for various services as requested by application software.

It is required to ensure the smooth running of the computer. Some of the critical role the system software plays are:

1.Process management

2.Resource management

3.Providing user interface

4.Security

5.System Monitoring and Performance

The Operating System

The Operating System is part of system software that manages the computer hardware. It intermediates between the user of a computer and the computer hardware.

The OS controls and coordinates the use of hardware among the different application software and the users.

The OS provides a user interface (UI) that allows users to interact with the computer system.

Some of the main functions of the operating system are:

1.Resource Management

2.Provides User interface which can either be Graphical Interface or Command Line.

3.Provide Security

4.Controls the execution of different programs and handles all the errors that may occur.

5.File system management –The OS handles tasks such as file allocation access permissions and storage management.

6.Memory Management. The OS allocates and deallocates memory to processes, tracks memory usage and kills any processes that are using too much memory and may crash the system.

Types of Operating Systems

Operating Systems are classified into different types depending on their capability of processing:

1.Single user and single tasking

2.Single user and multitasking

3.Multiuser

4.MultiProcessing

5.Real time

6.Embedded

1.Single User and Single Task OS

This is a type of operating system that supports only one user for standalone single computer for performing a single task. In a single user OS only one user can interact with the system at any given time.

This type of OS is typically found in personal computers (PC), an example of a single user OS is MS-DOS.

2.Single User and Multitasking OS

This type of OS allows execution of more than one task or process concurrently. The processor time is divided among different tasks. It is also known as time sharing OS.

When the OS switches between tasks it saves the current state of the task and restores the saved state of the next task.

3.Multiuser OS

This is used in computer networks that allow same data and applications to be accessed by multiple users at the same time. The users can also communicate with each other.

Unlike single user operating systems multi user operating systems enable multiple uses to access the systems resources and run their own applications concurrently.

An example of multiuser OS is linux and Windows

4.Real Time OS

This is a type of operating system that is designed to respond to an event within a predetermined time.

They are used in systems that have strict time constrains for any job to be performed.

This type of OS is designed for critical systems such as industries or hospitals.

An example of a Real Time OS is lynx.

5.Embedded OS

These are designed to run on embedded systems. Embedded systems are dedicated computer systems that are integrated in other machinery or appliance. They are specific to a device and are less resource intensive.

They are used in appliances like microwaves, washing machines, GPS navigation, climate control etc.

Device Drivers

These are system software that enable a computer to communicate with a specific hardware device. It intermediates between the device and the computer.

Device drivers are developed by the manufacturers. They are written in low level languages that offer direct access to hardware.

Device drivers are needed for all physical devices connected to the computer such as keyboards, hard disks, printers etc.

System Utilities

This is a type of software that helps in the maintenance of the computer. They typically come with the operating system but some are commercially sold. They optimise and enhance the functioning of the computer system.

Examples of system utility software are:

1.Backup software

2.Antivirus software

3.File Management software

4.Data compression software.

2.System software for the development of application and other software.

Provides services required for the development and execution of application and other software. System software provides the software tools required for the development of application software.

Programming Languages

Programming languages consist of a set of vocabulary and grammatical rules, to express the computations and tasks that the computer has to perform. They provide a set of rules and syntax for writing programs that can be executed by the computer.

Programming languages are a human friendly way to program a computer. They serve as a bridge between human readable instructions and machine executable code.

Programming languages can be divided into three categories:

1.Machine Language-This is what the computer can understand but it is impossible for a human being to understand. A machine language program is a collection of digits or bits.

2.Assembly Language-Falls between Machine Language and high level language. They allow the programmer to substitute names for numbers.

3.High level Language-This is easier to understand and resembles natural human languages and its easy for the programmer to understand but difficult for the computer to understand. Such languages require an intermediary layer between them and the hardware. Example of high-level programming languages are C, C++ and python.

1.APPLICATION SOFTWARE

The software that a user uses for accomplishing a specific task is the application software.

Application software maybe a single program or a set of programs.

Some examples of application software include:

1.Word processors

2.Web browsers

3.Text Editors